DISTRICT OF COLUMBIA
PUBLIC SCHOOLS

Grade #: 6-8
Unit: *Composting*

Overview and Goal of the Lesson:
The goal of the Unit is for student to set up a composting bin from start to finish. Students will begin with the organic matter, prepare the materials for composting and correctly set up the compost bin for optimal performance. Students will learn through a hands on approach how to create "zero waste" and reduce human impact on the environment.

Essential Question(s):
How can we minimize human impact on the environment through composting?

NGSS Emphasized and Addressed in this Lesson Sequence:

Performance Expectations	Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
MS-ESS3-3: Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.	**Constructing Explanations and Designing Solutions**: Constructing explanations and designing solutions in 6–8 builds on K–5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific ideas, principles, and theories.	**ESS3.C: Human Impacts on Earth Systems:** Human activities have significantly altered the biosphere, sometimes damaging or destroying natural habitats and causing the extinction of other species. But changes to Earth's environments can have different impacts (negative and positive) for different living things. (MS-ESS3-3)	**Influence of Science, Engineering, and Technology on Society and the Natural World:** All human activity draws on natural resources and has both short and long-term consequences, positive as well as negative, for the health of people and the natural environment. (MS-ESS3-1),(MS-ESS3-4)

Materials

Item	Quantity	Purpose
Compost bin	1 per school	to create compost
Bucket/trash can/bin	At least 1 per school	To collect compostable materials before transitioning them to the compost pile.
Shovel	At least 1 per school	To turn the compost
Box of plastic gloves	Enough for 1 per student	Protect hands while working with organic material
Small bucket	1 per group	

Notes: This lesson is best used in cooperation with the "what's cooking?" unit taught by your Health/PE teacher. Students will be using materials that will be perfectly compostable and will allow them to be hands on with the entire process.

This unit is also best done in the late summer/fall and spring seasons to allow students to be outdoors during the process.

5E Lesson Sequence

Total Duration: *60* minutes				
5E Model Stage	**Duration**	**Teacher and Student Actions**		**Notes**
Engage	*15* minutes	What Teacher Does	Say: Today we are going to learn about how we can help create "zero waste" through an action called composting. Composting is the decomposition of organic material to make dark, rich soil. Say: We have learned about Human's effects on the environment in previous units and composting, like recycling, is another way we can create less waste and reduce human impact on the environment. Let's watch a quick video that will breakdown composting. Play video: "composting for kids" and "vermicomposting"	Start a classroom worm bin using DPR's "classroom worm bin how-to-guide" "Composting for kids" - https://www.youtube.com/watch?v=dRXNo7Ieky8&t=15s "vermicomposting" - https://www.youtube.com/watch?v=n9Mnf9ysNSs Make sure to pass out the deliverable. (attached below)
		What Students Do	Students will watch, listen and take notes about composting	
5E Model Stage	**Duration**	**Teacher and Student Actions**		**Notes**
Explore	*15* minutes	What Teacher Does	Say: Before we get started, it is important that we take a look at what DCPS is doing to create "zero waste." Sustainable DC wants to meet a zero waste target of 80% diversion and 15% reduction by 2032. Currently, DCPS compost goes to "Maryland Environmental Service" Say: In the front of the room, I have placed organic	Prior to the lesson, the teacher should prepare a bin of compostable materials. Split into greens, browns and provide a few examples of things that can/cannot be composted. (Print out this poster that shows the different examples)

			materials on the table that may/may not be compostable. We are going to work in groups to split the organic materials into "greens" "browns" and "non-compostable." Each group will need one bin that has been labeled. If your bin is labeled "greens" then you will be sorting only "green" materials." (change this phrase depending on the different bins) Please refer to the powerpoint/poster to find out what organic material belongs where. Say: Each group member should be wearing gloves and organic material should only be on the table in the front of the room, or in your bins. Once you have filled your bin, bring it to your table and take a seat with your group.	*A visual organizer of "compostable" and "non-compostable" materials will be provided
		What Students Do	Students will sort the organic materials into compostable/non-compostable bins.	
5E Model Stage	**Duration**	**Teacher and Student Actions**		**Notes**
Explain	*5* minutes	What Teacher Does	Say: Earlier in the lesson I mentioned that we are learning about composting to help reduce human impact on the environment. What are some ways that humans impact the environment? Say: Great answers! Composting is a simple way to take materials that we have used and give them back to the environment. You heard me say "zero waste" earlier in the lesson. The Zero Waste movement is based on the idea that instead of sending materials to the incinerator or a landfill, we can re-use the products by giving them back to the environment.	
		What Students	Students should be seated in their groups, raising their	

		Do	hands to answer questions.	
5E Model Stage	**Duration**	**Teacher and Student Actions**		**Notes**
Elaborate	*15 of* minutes	What Teacher Does	Say: Now take a look at what you have placed in your individual bins. The reason we split our materials into "green" and "brown" is because we are going to create what I call a "lasagna" pattern in our compost. (Use PowerPoint for reference) We will be layering the material as such: (add more layers depending on amount of material, follow this pattern) 1. Add a base layer of dry brown material 2. Add a layer of green, moist material 3. Add a thin layer of soil 4. Add a layer of dry brown material 5. Moisten the three layers with a spray bottle Say: In a few minutes, we will be heading outside to take our materials and set up the compost bin. Before we go outside, lets get our buckets set up in order of material layers.	
		What Students Do	Students will be seated, answering questions while raising their hands. Then students will line up with their groups in order of the layers that will be needed for the compost bin.	
5E Model Stage	**Duration**	**Teacher and Student Actions**		**Notes**
Evaluate	*10* minutes	What Teacher Does	Say: We will go one layer at a time, spreading each bin evenly on the layer below. (instruct each group to come to the bin and deposit their organic materials)	Bring out the poster with the pictures of the "lasagna" layering in order to compare and contrast

			Say: Lets take a look at our reference poster and see if our compost layering/bin looks like the picture. After about two weeks we will come back out to check the process and rotate the layers. We will repeat this process until we can collect the rich, dark soil!	
		What Students Do	Students will be putting together the compost bin and comparing it to the pictures of compost bins provided by the teacher.	